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IS 8066 (1976): Mine Cars [MED 8: Mining Techniques and Equipment]

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Indian Standard

(Reaffirmed 1999)

SPECIFICATION FOR MINE CARS

1. Scope — Covers the requirements for flat bottomed mine cars of capacities 1·5 m^3 and above.

1.1 This standard does not cover the requirements for wheel-axle assemblies for the mine cars.

2. Dimensions — As specified in Table 1 read with Fig. 1.

TABLE 1 DIMENSIONS FOR MINE CARS

(*Clause* 2 and *Fig.* 1)

All dimensions in millimetres.

Car Sl No.	Capacity	Rail Gauge	Pay Load for Coal Tonnes	Internal Width	Internal Depth	Internal Length	Height Above Rail	Wheel Base	Coupling Height
	m^3	*G*		*W*	*h*	*L*	*H* *Max*	*S*	h_1
01	1·5	600	1·35	900	750	2 220	1 120	900	300
02	1·5	600	1·35	900	950	1 760	1 320	750	300
(03)	1·5	(762)	1·35	1 050	750	1 910	1 120	750	300
04	2	600	1·8	900	950	2 350	1 370	900	300
(05)	2	(762)	1·8	1 050	750	2 550	1 120	1 000	300
(06)	2	(762)	1·8	1 050	950	2 000	1 320	750	300
07	2	900	1·8	1 200	750	2 220	1 120	900	300
(08)	2·5	(762)	2·25	1 050	950	2 500	1 370	1 000	300
09	2·5	900	2·25	1 200	750	2 780	1 170	1 000	300
10	2·5	900	2·25	1 200	950	2 220	1 370	900	300
11	2·5	1 000	2·25	1 300	750	2 560	1 170	1 000	300
(12)	2·5	(1 067)	2·25	1 300	750	2 560	1 170	1 000	300
13	3	900	2·7	1 200	950	2 670	1 370	1 000	300
14	3	1 000	2·7	1 300	750	3 080	1 170	1 200	300
15	3	1 000	2·7	1 300	950	2 500	1 370	1 000	300
(16)	3	(1 067)	2·7	1 300	750	3 080	1 170	1 200	300
(17)	3	(1 067)	2·7	1 300	950	2 500	1 370	1 000	300
18	4	900	3·6	1 200	950	3 560	1 370	1 350	350
19	4	900	3·6	1 200	1 050	3 180	1 470	1 200	350
20	4	1 000	3·6	1 300	950	3 330	1 370	1 350	350
(21)	4	(1 067)	3·6	1 300	950	3 330	1 370	1 350	350
22	5	900	4·5	1 200	1 050	4 000	1 470	1 500	350
23	5	1 000	4·5	1 300	1 050	3 700	1 470	1 500	350
(24)	5	(1 067)	4·5	1 300	1 050	3 700	1 470	1 500	350

Note 1 — Coal pay load equivalents are based on a nominal 1 m^3 to 0·9 tonne.
Note 2 — Approx equivalent pay load for stone shall be taken as twice of that of coal.
Note 3 — Car serial numbers given within parenthesis shall not be used for new installations.

Mining Sectional Committee EDC 50; Mine Cars and Mine Tubs Subcommittee, EDC 50 : 4 [Ref: Doc: EDC 50 (2381)]

Adopted 26 May 1976

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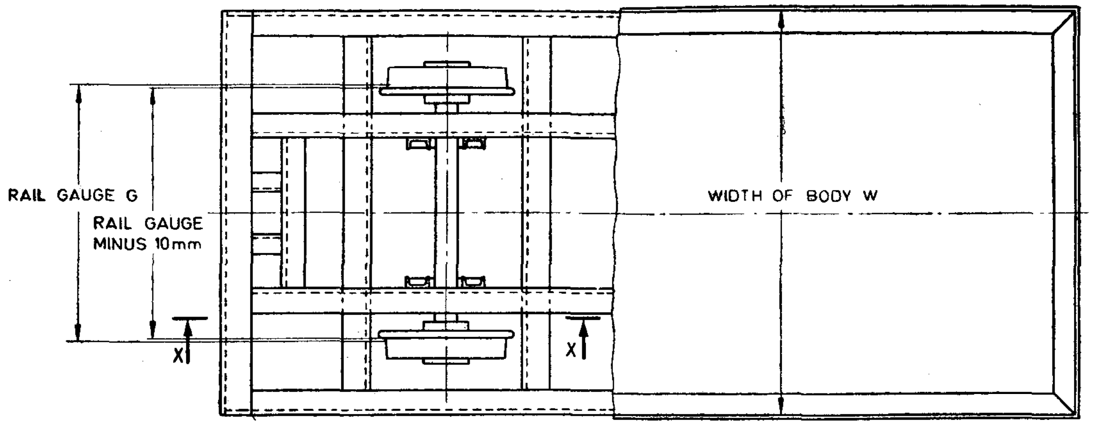
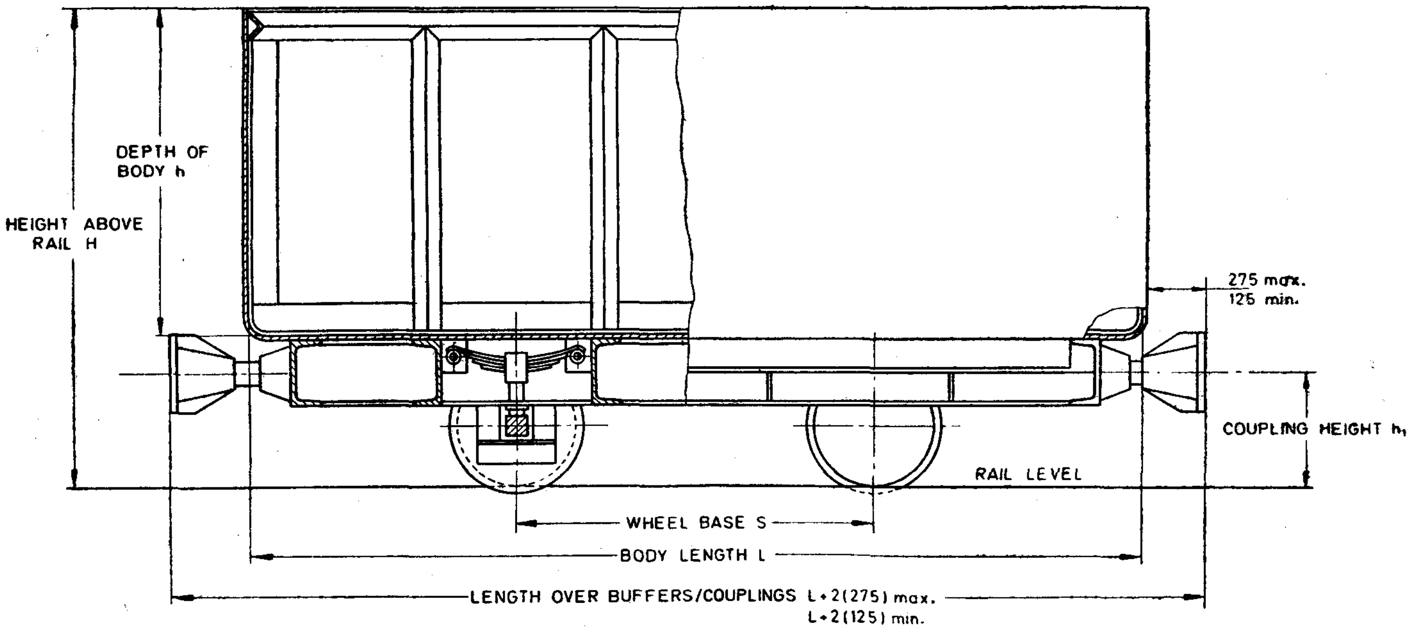


PLAN WITHOUT BUFFERS, SHOWING PART OF UNDERFRAME



ELEVATION(PARTLY SHOWN IN SECTION THROUGH XX)

All dimensions in millimetres.

FIG. 1 MINE CAR.

3. Tolerances

a)	Inside width and inside height	±10 mm
b)	Overlapping of sheets of the body, *Min*	15 mm
c)	Deviation of symmetry of longitudinal axis of the body and the underframe with respect to each other, *Max*	2·5 mm per metre body length
d)	The difference in lengths of diagonals of the body, *Max*	4·0 mm per metre body length

4. Material — As specified in Table 2.

5. General Requirements

5.1 *General*

5.1.1 Aluminium bodies and underframes shall not be welded. Aluminium rivets, when used, shall be of NR6 or HR30 alloys conforming to IS : 740 - 1966 'Wrought aluminium and aluminium alloys, rivet stock (for general engineering purposes)'.

5.1.2 Aluminium and steel, when combined, shall be insulated from each other either by bitumen paint or zinc chromate primer to avoid galvanic corrosion. If steel rivets are used a coat of zinc chromate primer shall be applied to the aluminium before riveting.

5.1.3 All welds shall be appropriate to the type of joint and shall be of adequate strength.

TABLE 2 MATERIAL FOR COMPONENTS OF MINE CARS

(*Clause* 4)

Component	Material	
	Steel	Aluminium
Body and underframe	IS : 226-1975 'Structural steel (standard quality) (*fifth revision*)	a) Plates conforming to HS20-WP or HS30-WP of IS: 737-1965 'Wrought aluminium and aluminium alloys, sheet and strip (for general engineering purposes) (*revised*)' b) Extruded sections conforming to HE30-WP of IS: 733-1967 'Wrought aluminium and aluminium alloys, bars, rods, and sections (for general engineering purposes) (*first revision*)'
Draw gear	a) 11Mn2 or 20Mn2 of IS: 1570-1961 'Schedules for wrought steels for general engineering purposes' b) Class 3, Class 3A or Class 4 of IS : 1875-1971 'Carbon steel billets, blooms, slabs and bars for forgings'	—
Springs	a) IS: 3195-1965 'Steel for the manufacture of volute and helical spring (for railway rolling stock)' b) 55Si2Mn90 of IS : 1570-1961	—

5.1.3.1 The welds shall be either continuous or intermittent as agreed between the manufacturer and the purchaser.

5.1.4 Ancillary handling equipment shall be well within the confines of the buffers or couplers.

5.2 *Body*

5.2.1 The body shall be rectangular in shape. The interior shall be free from wheel hoods, well bottoms and corrugations.

5.2.1.1 The sides and bottom of the bodies shall be manufactured from plates of minimum thickness 3·15 mm and 6 mm respectively.

5.2.1.2 An unequal angle (ISA 7045) or equal angle (ISA 5050 or more) or channel section (ISMC 75 or more) conforming to IS : 808-1964 'Specification for rolled steel beam, channel and angle sections' or flats (75 ISF 12 or more) conforming to IS : 1731 - 1971 'Dimensions for steel flats for structural and general engineering purposes (*first revision*)' shall be fixed at the top edge of the body for stiffening purposes.

5.2.2 The body shall be either riveted or welded to the underframe.

5.2.3 Where vehicles are to be used on over-rope or over-chain haulage systems, the upper edges of end plates shall be fitted with renewable wearing strips.

5.2.4 Bodies shall be so designed and constructed that there are no sharp edges liable to cause personal injury.

5.3 *Underframe*

5.3.1 Underframe shall be manufactured by either welding or riveting suitable channel or angle sections conforming to IS : 808 - 1964.

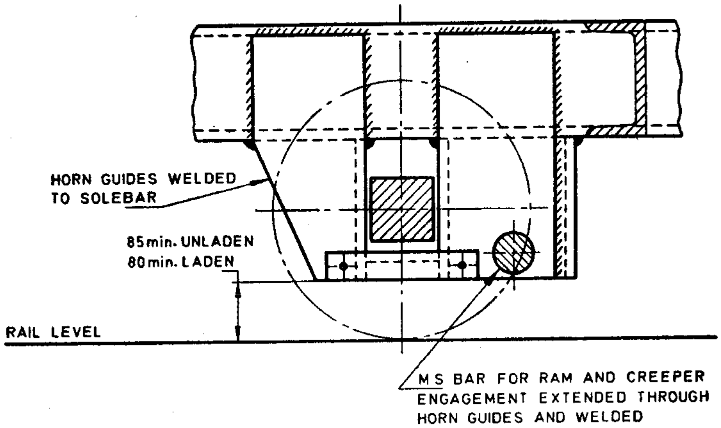
5.3.1.1 If required underframes may be manufactured from channels or angles of appropriate dimensions made of aluminium alloy.

5.3.2 Mine cars required to be mechanically engaged underneath by rams or creepers shall be fitted for the purpose with solid bar of mild steel as near as possible to the wheel axle (*see* Fig. 2).

5.3.2.1 In addition to the welding, the bar shall be securely bolted to the underframe.

5.4 *Draw Gear*

5.4.1 The draw gear or buffer gear shall preferably incorporate steel springs for shock absorbing purpose. Where solid buffers are used, the same shall be rigid enough to withstand the buffing shock.


HORN GUIDES WELDED TO SOLEBAR
85 min. UNLADEN
80 min. LADEN
RAIL LEVEL
M S BAR FOR RAM AND CREEPER ENGAGEMENT EXTENDED THROUGH HORN GUIDES AND WELDED

PART SECTION ON CL OF MINE CAR

All dimensions in millimetres.

FIG. 2 HORN GUIDES

5.4.2 The coupler housing shall be incorporated in the underframe and shall be of equal breaking strength as the coupler and capable of adequately transmitting the loads from coupler to the longitudinal members of the underframe.

5.4.3 The design of the draw gear shall ensure straight pull through the coupler, coupler housing and underframe.

5.4.4 The coupler shall be flexible enough to allow free movement of cars on sharp curves, shall be securely connected to the underframe and shall be easily replaceable.

5.5 *Brakes* — Brakes if provided shall be for parking purposes only.

5.6 *Suspension* — For suspension of mine car of pay load 3 tonnes and above, steel springs of laminated type (*see* Fig. 3) shall be provided between underframe and wheel axle assemblies.

6. Heat Treatment

6.1 All components of draw gear shall be subjected to one of the following heat treatments as agreed to between the purchaser and the manufacturer:

a) Normalizing by heating uniformly to a temperature between 870°C and 910°C and cooling in still air.

b) Normalizing as (a) above and tempering at a temperature between 550°C and 660°C.

c) Hardening and tempering by heating to a temperature between 870°C and 910°C followed by quenching in oil or water and tempering at a temperature between 550°C and 660°C.

6.1.1 Details of heat treatment given to the components of draw gear shall be endorsed on the certificate of test (*see* Appendix A).

7. Designation — A mine car of reference number 04 shall be designated as:

Mine Car 04 IS : 8066 - 1976

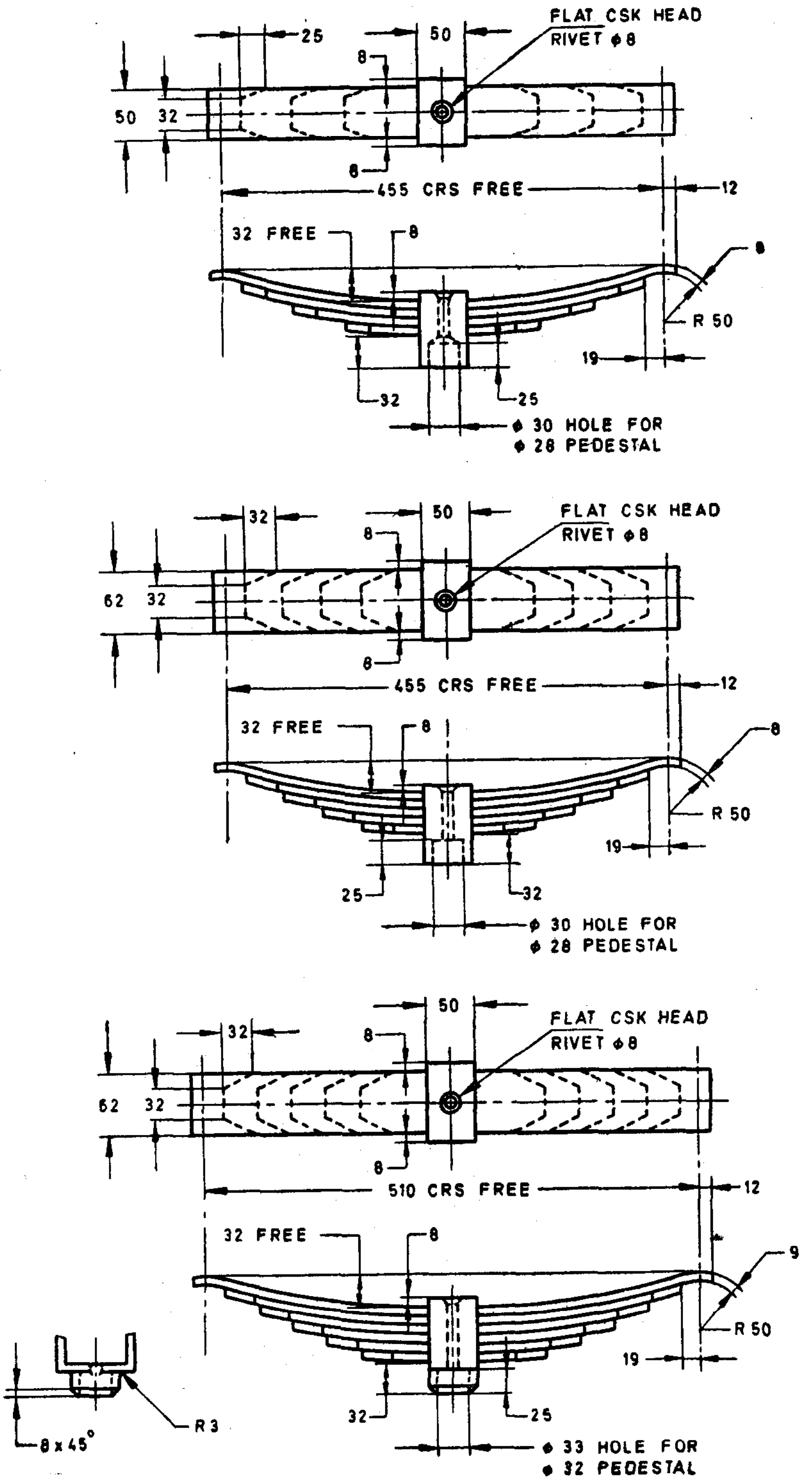
8. Information to be Supplied by the Purchaser While Ordering — While ordering the purchaser shall supply the following information to the manufacturer:

a) Car designation,

b) Designation of 'wheel axle assembly' (*see* IS : 8003 - 1976 'Specification for wheel axle assemblies for mine cars'),

c) Safe working load of draw gear required, and

d) Whether brakes are required.



NO. 1 SPRING

Recommended total load, *Max*	3 tonnes
No. of plates	4
Section of plates	50 × 8 mm
Length of plates	1 — 490 mm 2 — 425 mm 3 — 310 mm 4 — 200 mm

NO. 2 SPRING

Recommended total load, *Max*	5·25 tonnes
No. of plates	5
Section of plates	62 × 8 mm
Length of plates	1 — 490 mm 2 — 425 mm 3 — 340 mm 4 — 260 mm 5 — 180 mm

NO. 3 SPRING

Recommended total load, *Max*	7·50 tonnes
No. of plates	6
Section of plates	62 × 9 mm
Length of plates	1 — 540 mm 2 — 475 mm 3 — 405 mm 4 — 330 mm 5 — 255 mm 6 — 180 mm

All dimensions in millimetres

FIG. 3 SPRINGS

9. Testing of Draw Gear

9.1 *Destructive Test* — The manufacturer shall subject a prototype of draw gear to ultimate tensile strength test. The sample shall not fail before a load of seven times the safe working load is reached.

9.2 *Proof Load Test* — One draw gear from each production batch of 10 shall be subjected to a proof load of three times the safe working load and a certificate of test (*see* Appendix A) shall be supplied with each production batch.

10. Marking

10.1 Each component of draw gear shall be legibly marked on a non-vital part as follows:

a) Normalized or normalized and tempered components with the mark Ⓜ

b) Hardened and tempered components with the mark (OM)

10.1.1 The letters used shall be of 5 mm size.

10.2 Each mine car shall be marked with the following informations:

a) Car capacity,
b) Rail gauge, and
c) Manufacturer's name or trade-mark.

10.2.1 *ISI Certification Marking* — Details available with the Indian Standards Institution.

APPENDIX A

(*Clauses* 6.1.1 *and* 9.2)

PRO FORMA FOR THE CERTIFICATE OF TEST AND EXAMINATION DRAW GEAR

Distinguishing Mark	Description	Number Tested	Proof Load Applied Tonnes	Safe Working Load Tonnes

Type of heat treatment to which the draw gear has been subjected ....

....

We hereby certify that the draw gear described above complies in all respect with IS : 8066 - 1976 and that it was subjected to the appropriate proof load and subsequently examined by a competent person.

EXPLANATORY NOTE

This standard is intended to cover the flat-bottomed mine cars being emptied with the use of tipplers. Mine cars with well bottoms or having side or bottom openings for emptying are not covered by this standard. It is intended to issue separate standards for such mine cars. Further, till a separate standard for draw gears for mine cars is issued the draw gears of all designs will be covered by this standard.

While preparing this standard considerable assistance has been derived from the following standards:

DIN 20570 'Mine cars for coal, potassium and ores', issued by Deutsches Institute fur Normung.

JIS M6501-1952 'Mine steel tub,' issued by Japanese Industrial Standards Association, Japan.

NCB specification P147/1957 'Specification for solid bottom mine cars (Cap. 82-138 cuft)' issued by National Coal Board, U.K.

Printed at Sree Saraswaty Press Limited, Calcutta, India

AMENDMENT NO. 1 JULY 1995
TO
IS 8066 : 1976 SPECIFICATION FOR MINE CARS

(*Page* 2, *clause* **5.1.1**) — Substitute the following for the existing clause:

"**5.1.1** Aluminium bodies and underframes shall not be welded. Aluminium rivets, when used, shall be of 55000 or 64430 alloys conforming to IS 740 : 1977 'Wrought aluminium and aluminium alloys, rivet stock for general engineering purposes (*second revision*)'."

(*Page* 3, *Table* 2) — Substitute Table 2 given on page 2 of this Amendment for the existing table.

(*Page* 3, *clause* **5.2.1.2**) — Substitute the following for the existing clause:

"**5.2.1.2** An unequal angle (∠ 7045 or more) or equal angle (∠ 5050 or more) or channel section (ISMC 75 or more) conforming to IS 808 : 1989 'Dimensions for hot rolled steel beam, column, channel and angle sections (*third revision*)', or flats (75 ISF 12 or more) conforming to IS 1730 : 1989 'Dimensions for steel plates, sheets strips and flats for general engineering purposes (*second revision*)', shall be fixed at the top edge of the body for stiffening purposes."

(*Page* 3, *clause* **5.3.1**) — Substitute the following for the existing clause:

'**5.3.1** Underframe shall be manufactured by either welding or riveting suitable channel or angle sections conforming to IS 808 : 1989.'

TABLE 2 MATERIAL FOR COMPONENTS OF MINE CARS

(*Clause* 4)

Component	Material	
	Steel	**Aluminium**
Body and underframe	IS 2062 : 1992 'Steel for general structural purposes (*fourth revision*)'	a) Plates conforming to 64430 WP or 65032 WP of IS 737 : 1986 'Wrought aluminium and aluminium alloy sheet and strip for general engineering purposes (*third revision*)' b) Extruded sections conforming to 64430 WP of IS 733 : 1983 'Wrought aluminium and aluminium alloy bars, rods and sections for general engineering purposes (*third revision*)'
Draw gear	a) 11C15 or 20C15 of IS 1570 (Part 4) : 1988 'Schedules for wrought steels : Part 4 Alloy steels (alloy constructional and spring steels) with specified chemical composition and related mechanical properties (*first revision*)' b) Class 3, Class 3A or Class 4 of IS 1875 : 1992 'Carbon steel billets, blooms and bars for forgings (*fifth revision*)'	
Springs	a) IS 3195 : 1992 'Steel for the manufacture of volute and helical springs (for railway rolling stock) (*third revision*)' b) 55Si7 of IS 1570 (Part 4) : 1988	

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